Effect of cigarette smoking on microvascular reactivity to norepinephrine in rat cremaster muscle

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摘要

Abstract

This experiment was designed to study the effects of cigarette smoking on microvascular reactivity in an intact microvascular preparation. The vasoconstrictive responses of arterioles in rat cremaster muscles to topically applied noradrenaline were measured in 8 rats after a three-week period of inhaling cigarette smoke. A parallel set of experiments was in a control group of 8 rats for comparison. All three orders of arterioles in the muscles of rats exposed to smoke were significantly narrower than those of the controls ($p < 0.0001$). The dose response curve of all three orders of arterioles shifted to the right of their respective controls. The effective concentrations of noradrenaline to cause 50% vasoconstriction (EC 50) of all three orders of arteriole was profoundly increased in rats that inhaled smoke compared with the control group ($p < 0.05$). We conclude that skeletal muscle arterioles in rats exposed to cigarette smoke may become hyposensitive to noradrenaline, or their degree of freedom from constriction may be reduced. Our results suggest that cigarette smoking is associated with significant functional alterations in the microcirculation.